nitric peroxide. Now this gas, besides often being objectionable on its own account, would undoubtedly tend to reduce the yield of ozone. Mr. Andreoli does not, however, admit that nitric peroxide is formed in his apparatus, and if further experience should support his contention it would seem that he has really effected a substantial improvement.

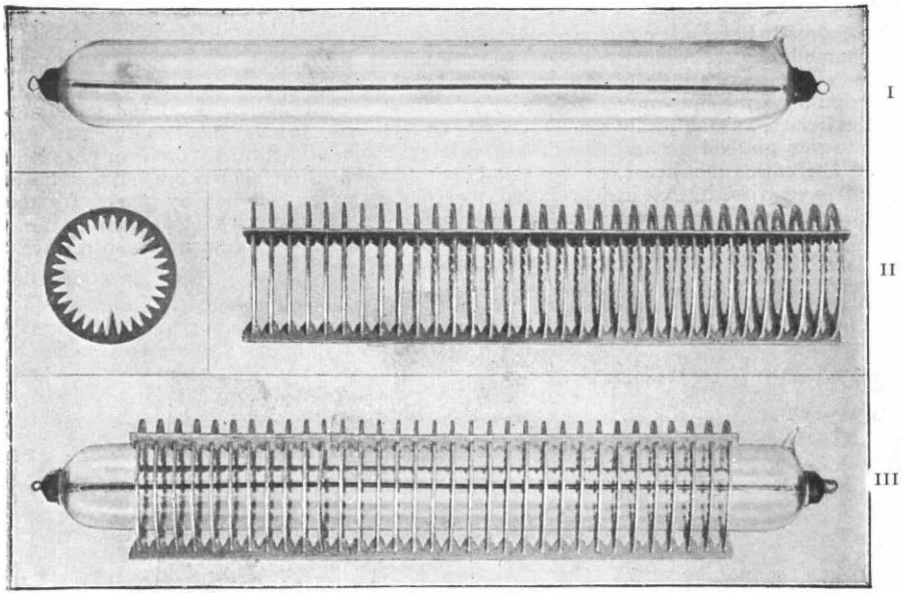

Fig. 2.

For medical purposes the new apparatus takes the form of a vacuum tube (I, Fig. 2), containing a metallic rod. This is surrounded by an armature (II and III, Fig. 2), made of aluminium and armed with points. When the latter and the metallic rod are joined up to a coil or to a step-up transformer a glow makes its appearance, and the air between the two electrodes is rapidly ozonised. If a stream of ozonised air is required for inhalation, or must be conveyed to any particular locality, the above little apparatus is surrounded by a glass jacket, as shown in Fig. 3.

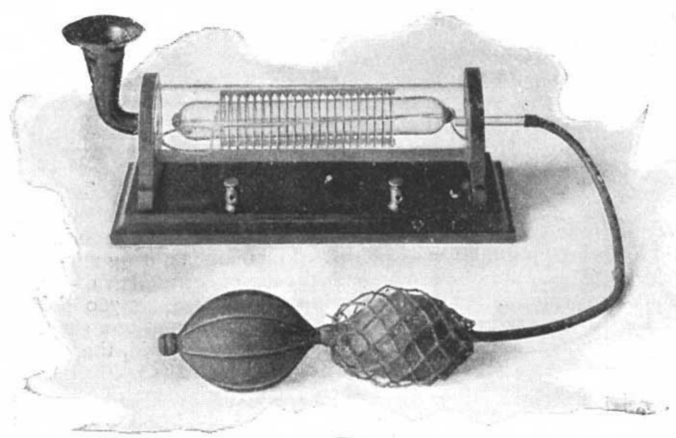

Fig. 3.

Air or oxygen can then be pumped through the apparatus, and thence delivered from a celluloid trumpet for inhalation, or conveyed by a tube to the required locality. The use of india-rubber should be avoided in this part of the apparatus, as india-rubber perishes with astonishing rapidity when exposed to the action of ozone.

It seems often to be supposed by inventors and others, that air and oxygen may be employed indifferently as sources of ozone. This, however, is not really the case. If moderately pure oxygen be used, nitrous fumes are far less likely to be formed than when air is employed; and this is so not only in the event of large sparks passing in the ozoniser, but also when the gas is subjected to the influence of the silent discharge. Unfortunately we do not yet know the exact conditions under which the silent discharge induces the formation of nitric peroxide, though the subject is being investigated; and therefore for the present, unless it can be shown that nitric peroxide is itself beneficial, or, at least, quite unobjectionable, ozone for medical use should certainly be prepared from oxygen whenever it is possible to do so.

A DRAGON OF THE PRIME.

The little Warwickshire village of Stockton, ploughed and excavated by three manufacturing cement firms, has long yielded to collectors choice specimens of Lower Middle Lias fossils. Its late rector educated the quarrymen by lectures and in conversation to understand and value the vertebræ and belemnites and limas and encrinites which they continually disinterred, forming with their help a collection which on his departure went to form the nucleus of a County Council museum. The Saurian remains have hitherto been always fragmentary, a fact due, perhaps, to the men's careless digging; but the rector left them with a prediction that a perfect monster would some day be unearthed, an entreaty that should they ever come across a head or a continuous backbone, they would drop pick and crowbar, and call in experts to direct and continue the search. A week or two ago the prediction was fulfilled, and the advice remembered. The wielder of a pickaxe suddenly announced that he was "grapplin' along a lot of backbones"; the work was stopped, the foreman summoned, and slowly with due precaution a noble Icthyosaurus was uncovered. He lies 45 feet below the surface; 20 feet in length, the head 2 feet across, and 3 feet 10 inches long. The paddles are unusually distinct, the front pair 2 feet 6 inches, the hind pair 1 foot 8 inches in length. The tail is abruptly curved, and some of the lumbar vertebræ are slightly displaced. The pelvic ring is missing, removed, perhaps, before the nature of the find was guessed, and still to be recovered. The quarry belongs to Mr. M. Lakin, of Leamington, who intends, I understand, to present the specimen to the Natural History Museum at South Kensington. Crowds from all parts of the county throng to see it;

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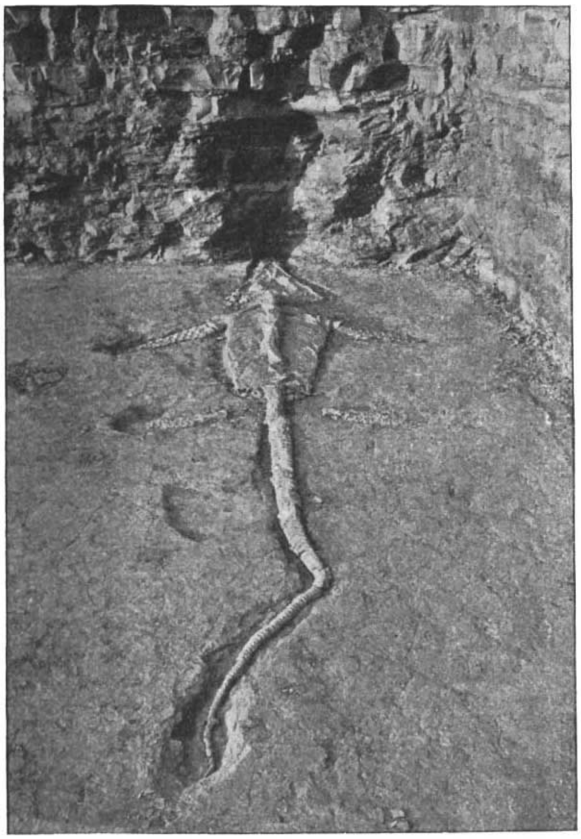
and not a little vigilance is necessary to protect it from dishonest visitors, attempting to purloin teeth or fragments. It has been beautifully photographed by Mr. H. Elkington, of Broadwell, Rugby (a reproduction of the photograph accompanies this notice), who will, on application, furnish copies to geologists and others desiring them.



W. T.

DR. JOHN HOPKINSON, F.R.S.

THE news that Dr. John Hopkinson, F.R.S., met his death in a terrible mountain accident on Saturday last, has been received with deep regret in the scientific world. His name is familiar to every student of electricity and its applications, and by his death electrical science has lost one of its most active and brilliant workers. It appears from the telegraphic reports that Dr. Hopkinson, who was a practised mountaineer, started from Arolla on Saturday morning, with his son John and two daughters, to ascend the Petite Dent de Veisivi, one of the striking points dominating Evolena, in the Val d'Hérens, running south from the Rhône Valley at Sion. The ascent is not considered a very dangerous one, and the party went without guides. Nothing having been seen of them on Saturday night, search parties were organised, and the melancholy discovery was made that a catastrophe had occurred, the dead bodies of Dr. Hopkinson and his three children being found roped together, but terribly mutilated, at the foot of the highest cliffs. How the accident happened is not known, but probably one of the party slipped whilst climbing a cliff, and all four then fell from rock to rock several hundred feet to the moraine below. Like Francis Balfour and Milnes Marshall, Dr. Hopkinson has lost his life while mountain climbing, and like them also he leaves behind a rich record of work done for the advancement of science.

Dr. Hopkinson was born at Manchester in 1849, and was the eldest son of Alderman Hopkinson, an ex-Mayor of that city. In his sixteenth year he went to Owens College, where he remained for two years and a half, and then went to Trinity College, Cambridge. In 1871 he was Senior Wrangler and First Smith's Prizeman, and was appointed fellow and tutor of his college. While at Cambridge he obtained the D.Sc. degree at London University. Referring some years later to the influences which helped to mould his career, he said :—

"My father cultivated in me a taste for science from a time before I can remember; my mother gave me the first systematic instruction of which I have any recollections. If my father gave me my first taste for science, you may be sure that taste was encouraged at Owens College. Mathematics is the most essential weapon of the physicist, and nowhere can mathematics be learned as at Cambridge. I owe to Sir William Thompson the first impulse to experimental work in electricity and magnetism. He has been to me for many years the kindest of friends, always ready to encourage and to help."

After leaving Cambridge Dr. Hopkinson was for six years with Messrs. Chance and Co., near Birmingham, as their engineer. He removed to London in 1878, and, after commencing practice as a general engineer, took up electrical engineering, in which branch of applied science his most valuable investigations have been accomplished. He was elected a Fellow of the Royal Society in 1878, and received one of the Royal Medals of the Society in 1890, for his researches in magnetism and electricity. In presenting the medal, the President pointed out that Dr. Hopkinson's researches comprised investigations of the effect of temperature upon the magnetic properties of iron, nickel, and various alloys of these metals. Before these investigations were published it was thought that increased temperature tended to diminish the magnetic susceptibility of iron. Dr. Hopkinson's experiments showed, however, that, on the contrary, the magnetic susceptibility increases enormously as the temperature increases, until the temperature reaches about 660° C.; beyond this temperature iron entirely ceases to be magnetic. He also made a series of determinations of the specific inductive capacities and refractive indices of a large number of transparent dielectrics, the results of which are of great importance in the theories of electricity and light. In addition to these researches, he introduced many improvements into lighthouse equipment, notably the "group flashing apparatus."

Dr. Hopkinson's contributions to the theory of dynamo-electric machinery are most important; and to him electricians owe the method, now so extensively used, of solving problems relating to dynamos by the use of the "characteristic curve." On the subject of dynamo-electric machinery Dr. Hopkinson was, indeed, a leading authority. A volume containing a number of his papers on this and allied subjects was published in 1892, and it constitutes a valuable testimony to the scientific and practical importance of his researches. The work contains an account of a very complete and exhaustive set of experiments on dynamo machines under working conditions, and graphical representations of the results. In referring to Dr. Hopkinson's work in these columns, the reviewer remarked: "No device in the whole history of the evolution of the dynamo has been of more general service than his plan of exhibiting the results of experiments in the well named characteristic curve of the machine. This did for the dynamo what the indicator diagram had long been doing for the steam engine, though not, of course, in the same way. With the most admirable simplicity

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